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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/757,366

01/13/2004

Franklin W. Dabby

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12/18/2006

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EXAMINER

DUPUIS, DEREK L

ART UNIT

PAPER NUMBER

2883

DATE MAILED: 12/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/757,366	DABBY, FRANKLIN W.	
	Examiner	Art Unit	
	Derek L. Dupuis	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 6-8 and 14-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-13, 23 and 25 is/are rejected.
- 7) ☒ Claim(s) 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/5/2006 has been entered.

Response to Arguments

2. Applicant's arguments filed 12/5/2006 have been fully considered but they are not persuasive. Applicant argues that because Yamamoto does not discuss signal amplification, there is no motivation and the combination of Yamamoto and Lange is improper. The examiner disagrees. Although Yamamoto et al do not discuss amplification; signal amplification is nevertheless a desirable effect in optics. Lange et al teach that by doping waveguides with common amplifying materials, light signals can be amplified to result in improved communication. As stated in the previous office actions, one of ordinary skill in the art would have found it obvious to include amplifying materials in the waveguide since Lange teaches that this will amplify the signal and lead to large gains in compact devices. Just because Yamamoto does not discuss amplification does not mean that improved gain would not be a beneficial improvement in the device disclosed by Yamamoto. It is well recognized in the art that gain in optical propagation means is beneficial since increases signal strength and improves communication.

3. Applicant also argues that Yamamoto et al do not disclose pumping. Pumping is routinely used in combination with amplifying dopants such as Er and Yb. Lange discloses waveguide doped with rare-earth ions are pumped to result in signal gain (see page 6).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5, 9, 10, 12, 23, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Yamamoto et al (US 6,078,70)* in view of *Lange et al ("High Gain Short Length Phosphate Glass Erbium-Doped Fiber Amplifier Material" NPL)*.

6. Yamamoto et al teaches an integrated electro-optic circuit comprising a semiconductor substrate composed of a material suitable for use as a detector of a predetermined signal wavelength and an electronic circuit layer positioned on the substrate. The circuit also includes a buffer layer positioned on the circuit layer and a waveguide layer positioned on the buffer layer wherein the waveguide layer is formed of phosphate glass. Yamamoto et al also teach a cladding layer disposed on the waveguide layer where an index of refraction of the waveguide layer is greater than that of the cladding layer and the buffer layer. The electronic circuit layer includes an optical sensor for detecting a coupling signal comprising a portion of a photonic communication signal propagating in the waveguide (see column 13, lines 15-65). The circuit also includes a light signal tap for directing the coupling signal towards the sensor. The tap includes a region of the buffer layer that has an increased index of refraction with respect to the

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index of refraction of the buffer layer (see column 19, lines 1-62). Light is carried through the wave guiding section which Yamamoto describes includes the waveguide and the buffer layer.

Therefore, the tap directs the coupling light through the buffer layer since the light is propagated through the buffer layer as part of the wave guiding section (see column 13, lines 45-6).

Yamamoto et al teach that the substrate can comprise silicon.

7. Yamamoto et al do not teach that the phosphate glass waveguide layer is doped with an amplifying material. Lange et al teach using Er and Yb to dope a phosphate glass waveguide (see page 2) and that the waveguide can be used to transmit wavelengths between 800 and 1800 nm (see figure 3). Lange et al also teach that a signal pump source is used to propagate a pump signal (see page 6).

8. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the circuit of Yamamoto et al by using a Er-Yb-doped waveguide as taught by Lange et al. Motivation to do this would be that Er-Yb-doped waveguides have a significant capacity for large gain per length coefficients which leads to the ability to achieve large gain in compact devices (see page 2 of Lange et al).

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Yamamoto et al* (US 6,078,70) in view of *Lange et al* ("High Gain Short Length Phosphate Glass Erbium-Doped Fiber Amplifier Material" NPL) as applied to claims 1-5, 9, 10, 12, 23, 25, and 26 above, and further in view of *Han et al* (US2004/0076813 A1).

10. Lange et al teach that the waveguide transmits signals between 1100 nm and 1600 nm. However, neither Yamamoto et al nor Lange et al teach that the substrate comprises gallium aluminum arsenide. Han et al teaches that several different types of substrates can be used in

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optical devices including silicon and gallium aluminum arsenide (see paragraph 15). It would have been obvious to one of ordinary skill in the art at the time of invention to modify the device of Yamamoto et al in view of Lange et al to use a germanium substrate as taught by Han et al since it is well known and routine to use AlGaAs substrates in opto-electronic devices.

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Yamamoto et al (US 6,078,70)* in view of *Lange et al ("High Gain Short Length Phosphate Glass Erbium-Doped Fiber Amplifier Material" NPL)* as applied to claims 1-5, 9, 10, 12, 23, 25, and 26 above, and further in view of *Harchanko et al (US 2005/0147925 A1)*.

12. Yamamoto et al nor Lange et al teach that the substrate is made of germanium. However, Harchanko et al teach that several different types of substrates can be used in optical devices depending on the desired wavelength transmission range including silicon and germanium. Harchanko et al teach that a germanium substrate can be used for wavelengths greater than 2000 nm (see paragraph 48). It would have been obvious to one of ordinary skill in the art at the time of invention to modify the device of Yamamoto et al in view of Lange et al to use a germanium substrate as taught by Harchanko et al since it is well known and routine to use germanium substrates in opto-electronic devices for processing signals with high wavelengths.

Allowable Subject Matter

13. Claim 24 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter:

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15. Claim 24 is allowable over the prior art of record because the latter, either alone or in combination, does not disclose nor render obvious an integrated electro-optic circuit comprising a waveguide positioned on a buffer layer, the waveguide being formed of a phosphate glass doped with an amplifying material and a cladding layer positioned on the waveguide layer wherein the cladding layer is doped with an amplifying material and wherein an index of refraction of the waveguide is greater than an index of refraction of the buffer layer and greater than an index of refraction of the cladding layer in combination with the rest of the claimed limitations.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L. Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Friday 8:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Derek L. Dupuis
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